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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/690,871	10/22/2003	Wei-Hong Liu	10113051	6815

34283 7590 12/18/2006

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EXAMINER

KOEMPEL THOMAS, BEATRICE L

ART UNIT	PAPER NUMBER
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2196

DATE MAILED: 12/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/690,871

Applicant(s)

LIU, WEI-HONG

Examiner

Bea Koempel-Thomas

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on 22 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. Claims 1-27 are pending in this application and presented for examination.

Objections

Abstract

1. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

2. The abstract of the disclosure is objected to because the abstract merely repeats the title and does not adequately describe the disclosure. Correction is required. See MPEP § 608.01(b).

Claim Objections

3. Claim 16 is objected to because of the following informalities: "the call gate selector," "the entry point," and "the global descriptor table" lack antecedent basis. To further prosecution, the examiner considered this claim as depending from claim 15, which provides antecedent basis for each of the terms. Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 2, 10, 11, 19, and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Warwick et al., U.S. Patent No. 6,598,169 B1, (hereinafter “Warwick”).

6. Regarding **claim 1**: Warwick discloses a system for performing kernel-mode operations (col. 2 lines 30-31) comprising:

a kernel-mode interface generator (Figure 2 and col. 5 lines 31-34, and 41-47) for generating a kernel-mode interface driver (col. 5 line 51), which in turn generates a call gate (col. 5 line 49), to perform a kernel-mode operation with kernel-mode authorization (col. 5 line 47) in a kernel mode; and

an authorization interface (Figure 2 and col. 5 line 43), coupled to the kernel-mode interface generator (Figure 2 and col. 5 line 45), to connect a user mode to kernel mode (col. 5 lines 49-50), switching a process (col. 5 lines 55-56), from user mode to kernel mode via the call gate (col. 5 line 49), to perform the kernel-mode operation (col. 5 line 58).

7. Regarding **claim 10**: Warwick discloses a method for performing kernel-mode operations (col. 2 lines 42-45) comprising steps of:

providing a kernel-mode generator (Figure 2 and col. 5 lines 31-34, and 41-47);

generating a kernel-mode interface (col. 5 line 51), using the kernel-mode generator to generate a call gate (col. 5 line 49), performing a kernel-mode operation with kernel-mode authorization in a kernel mode (col. 5 line 47);

providing an authorization interface (Figure 2 and col. 5 line 43), to connect a user mode to the kernel mode (col. 5 lines 49-50); and

switching a process (col. 5 lines 55-56), from the user mode to the kernel mode via the call gate (col. 5 line 49), through the authorization interface (Figure 2 and col. 5 line 43) to perform the kernel-mode operation with kernel-mode authorization (col. 5 line 58).

8. Regarding **claim 19**: Warwick discloses a storage medium for storing a computer program (claim 1) providing a method for performing kernel-mode operations (col. 2 lines 42-45), comprising using a computer to perform the steps of:

providing a kernel-mode generator (Figure 2 and col. 5 lines 31-34, and 41-47);

generating a kernel-mode interface (col. 5 line 51), using the kernel-mode generator to generate a call gate (col. 5 line 49), performing a kernel-mode operation with kernel-mode authorization in a kernel mode (col. 5 line 47);

providing an authorization interface (Figure 2 and col. 5 line 43), to connect a user mode to the kernel mode (col. 5 lines 49-50); and

switching a process (col. 5 lines 55-56), from the user mode to the kernel mode via the call gate (col. 5 line 49), through the authorization interface (Figure 2 and col. 5 line 43) to perform the kernel-mode operation with kernel-mode authorization (col. 5 line 58).

9. Regarding **claims 2, 11, and 20**: Warwick discloses that the authorization interface (Figure 2 and col. 5 line 43), sends a call gate request (col. 5 line 49), to the kernel-mode

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interface generator (Figure 2 and col. 5 lines 31-34, and 41-47), to generate the kernel-mode interface driver (col. 5 line 51), the call gate generated accordingly (col. 5 line 49), and the authorization interface (Figure 2 and col. 5 line 43), instructing (col. 5 lines 55-56), the process to enter the kernel mode through the call gate (col. 5 line 49).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 3-9, 12-18, and 21-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Warwick in view of Gao, et al, "Embedded microprocessor protection mode of high-privilege system call," Chinese Journal of Computers, 2000, v. 23 n. 3, pp. 318-323, (hereinafter "Gao").

12. Regarding **claims 3, 12, and 21**: Warwick discloses that the kernel-mode operation's authorization level is in the kernel mode (col. 5 line 47).

Warwick does not disclose that the kernel mode is Ring 0. Gao teaches that the kernel mode is Ring 0 (paragraph 2.1).

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Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the kernel mode disclosed by Warwick with the ring label taught by Gao in order to signify that operations taking place therein are occurring at the most privileged level.

13. Regarding **claims 4, 13, and 22**: Warwick discloses a process, a user-mode operation (col. 5 lines 55-56). Warwick does not disclose that the process is capable of user-mode authorization in a protected mode.

Gao teaches that a process is capable of user-mode authorization in a protected mode (paragraph 1).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the process disclosed by Warwick with protected mode taught by Gao in order to create a more secure implementation of a user level process.

14. Regarding **claims 5, 14, and 23**: Warwick does not disclose that the user-mode authorization is Ring 3 authorization level in the protected mode.

Gao teaches that the user-mode authorization is Ring 3 authorization level in the protected mode (paragraph 2.2).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the user mode disclosed by Warwick with the ring label taught by Gao in order to signify that operations taking place therein are occurring at the least privileged level.

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15. Regarding **claims 6, 15, and 24**: Warwick does not disclose that the call gate sets a call gate selector and an entry point in a global descriptor table, having a call gate descriptor and a code-segment descriptor, to enable the process to perform the operation with kernel-mode authorization in the kernel mode.

Gao teaches that the call gate (abstract and paragraph 2.3), sets a call gate selector (paragraph 2.3), and an entry point (paragraph 2.3), in a global descriptor table (paragraph 2.2), having a call gate descriptor (Figure 3), and a code-segment descriptor (Figure 3), to enable the process to perform the operation with kernel-mode authorization in the kernel mode.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system disclosed by Warwick with the system employing call gates taught by Gao in order to implement a secure interface between user and kernel modes.

16. Regarding **claims 7, 16, and 25**: Warwick does not disclose that the user-mode authorization of the process is switched to kernel-mode authorization by the call gate selector via the entry point in the global descriptor table, and is switched back after the operation with kernel-mode authorization has been performed.

Gao teaches that the user-mode authorization of the process is switched to kernel-mode authorization (paragraph 2.4), by the call gate selector (paragraph 2.3), via the entry point (paragraph 2.3), in the global descriptor table (paragraph 2.2), and is switched back after the operation with kernel-mode authorization has been performed (paragraph 2.4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system disclosed by Warwick with the system taught by Gao in order to implement a secure interface between user and kernel modes.

17. Regarding **claims 8, 17, and 26**: Warwick does not disclose that a far call stated by the call gate selector points to the call gate descriptor, and a CPU switches an instruction pointer to the entry point, when a caller from the call gate gives a call, if the caller has kernel-mode authorization.

Gao teaches that a far call stated by the call gate selector (paragraph 2.3), points to the call gate descriptor (Figure 3), and a CPU switches an instruction pointer to the entry point (paragraph 2.3), when a caller from the call gate gives a call, if the caller has kernel-mode authorization (paragraph 2.4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system disclosed by Warwick with the system taught by Gao in order to implement a secure interface between user and kernel modes.

18. Regarding **claims 9, 18, and 27**: Warwick does not disclose that the instruction pointer has kernel-mode authorization, is switched to the entry point, to perform the operation with kernel-mode authorization in the kernel mode, and is switched back to the user-mode authorization after the operation with kernel-mode authorization has been performed.

Gao teaches that the instruction pointer (paragraph 2.3), has kernel-mode authorization (paragraph 2.4), is switched to the entry point (paragraph 2.3), to perform the operation with

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kernel-mode authorization in the kernel mode, and is switched back to the user-mode authorization after the operation with kernel-mode authorization has been performed (paragraph 2.4).

Conclusion

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure is:

- Bonola, U.S. Patent No. 6,412,053 B2, regarding linearly scalable dynamic memory management in a multiprocessing system.
- Bonola, U.S. Patent No. 6,480,919 B2, regarding kernel exported entry points.
- Cutler et al., U.S. Patent No. 5,752,031, regarding a queue object for controlling concurrency in a computer system.
- Friedman et al., U.S. Patent No. 6,804,784 B1, regarding back-channeling in a memory vault system.
- Gbadegesin, U.S. Patent No. 6,779,035 B1, regarding an application programming interface.
- Hsu, U.S. Patent No. 5,584,023, regarding a transparent and secure file transform mechanism.
- Lacombe et al., U.S. Patent No. 7,003,775 B2, regarding a hardware implementation of an application-level watchdog timer.
- Wong et al., U.S. Patent Publication No. 2002/0152331 A1, regarding a user mode device driver interface.

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- Yates, Jr. et al., U.S. Patent No. 7,065,633 B1, regarding a system for delivering exceptions between architectures in dual architecture CPUs.
- Cheriton, et al., "A Caching Model of Operating System Kernel Functionality," Proceedings of the First Symposium on Operating Systems Design and Implementation, Usenix Association, November 1994.


Please direct any inquiry concerning this communication or earlier communications from the examiner to Bea Koempel-Thomas whose telephone number is 571-270-1252. The examiner can normally be reached on Monday - Thursday & alternate Fridays; 0730 - 1700.

If attempts to reach the examiner by telephone are unsuccessful, please contact the examiner's supervisor, Nabil El-Hady, on 571-272-3963. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

bkt




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